REMARKS

The remainder of this Reply is set forth under subheadings for the convenience of the Examiner.

Rejection of Claims 1-13 and 38 under 35 U.S.C. §112, Second Paragraph

Claims 1-13 and 38 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Examiner states that the claims are vague and indefinite in the recitation of 'analog' and that one of skill in the art would be unable to determine the metes and bounds of such a limitation.

"Emulsans" as that term is employed in the application are "groups of polyanionic amphiphathic lipoheteropolysaccharides [sic] secreted by *Acinetobacter calcoaceticus* RAG-1 when fed ethanol" (specification, page 9, lines 10-12) as depicted by the chemical structures in Figure 1. Further, Applicants state in the specification on page 9, lines 13-14, that "emulsan analog" refers to "structural analogs of the group of emulsans as defined above." Applicants also state that "the term 'emulsan analog' also refers to emulsans obtained from *A. calcoaceticus* mutants (e.g., transposon mutants) which can be, for example, emulsans obtained by mutants grown on ethanol as well as mutants grown on carbon sources other than ethanol" (e.g., ethyl propionate) (specification, page 9, lines 21-24). Hence, the subject matter and scope of the patent protection sought for the claimed invention is precisely set forth in the specification. Applicants' use of the term "emulsan analog" is definite and the metes and bounds of "emulsan analogs" are clearly defined, as required under 35 USC §112, second paragraph. Reconsideration and withdrawal of the rejection are respectfully requested.

Rejection of Claims 1-11 and 37-38 under 35 U.S.C. §102(b)

Claims 1-11 and 37-38 are rejected under 35 U.S.C. §102(b) as being anticipated by Gutnick *et al.* The Examiner states that the claims are drawn to a composition comprising an antigen and an emulsan and that Gutnick *et al.* (U.S. Patent 4,311,829) disclose a composition comprising an antigen and an emulsan.

Applicants claim an immunization formulation comprising an antigen and an emulsan or emulsan analog. Applicants state that "the present invention relates to emulsan and emulsan analogs used as "adjuvants in immunization formulations" (specification, page 6, lines 12-13). An adjuvant, as defined in the specification, "refers to a composition (e.g., emulsan or emulsan analog) which elicits immune responses to antigens" (specification, page 6, line 29, through page 7, line 1). Moreover, Applicants state, for example, on page 6, lines 14-16, that "emulsan or emulsan analogs can be combined with an antigen to generate an immune response in a host which can, for example, result in the production of antibodies to the antigen. . . ." The adjuvant activity of emulsan was exemplified in the specification on page 39, line 1 through page 40, line 3 and shown in Figures 11A and 11B. Specifically, Applicants' claimed immunization formulation increased the production of antibodies to the antigen, KLH-DNP (dinitrophenol coupled to keyhole limpet hemacyanin) (compare the antiserum dilution of "Ag Alone" and "EM Alone" with "EM (low) & Ag" or "EM (high) & AG" (Figures 11A and 11B)). The predominant immune response was **not** to emulsan or an emulsan analog, but to the antigen component in the composition. Specifically, the majority of the antibodies generated by Applicants' immunization formulation were specific to the antigen component, not to the emulsan or emulsan analog component.

Applicants respectfully submit that an antigen is characterized in the art as generating the predominant immune response, while an adjuvant is characterized in the art as generating a minor immune response relative to the antigen in an immunization composition. For example, an immunology textbook (Abbas, A.K., *et al., Cellular and Molecular Immunology*, W.B. Saunders Company, Philadelphia), page 117 of which is attached as Exhibit A, states:

> Adjuvants often need to be administered in addition to the antigen in order to elicit an immune response to antigen. These adjuvants are usually insoluble or undegradable substances that promote non-specific inflammation, with the recruitment of mononuclear phagocytes at the site of infection

Abbas *et al.* also state, at page 4, which is attached as Exhibit B, that antigens are "[f]oreign substances that induce specific immunity." Thus, with regard to Applicants' composition, an

emulsan or an emulsan analog, used as an adjuvant, will generate a relatively minor immune response in comparison to the antigen.

In contrast, Gutnick *et al.* teach an immunization formulation comprising "β-emulsan and complete Freund adjuvant" and that "[a]ntibodies prepared against β-emulsan cross-react in an identical fashion with α-emulsan..." (Gutnick *et al.*, column 26, line 58 through column 27, line 8). In contrast to Applicants' claimed immunization formulation, the predominant immune response of the immunization formulation was to the β-emulsan, not Freund's adjuvant. Therefore, the antigen of the immunization formulation of Gutnick *et al.* was the emulsan, and the adjuvant (in other words, the component that "elicits an immune response to antigen") was Freund's adjuvant and not, as in Applicants' claimed invention, an emulsan or emulsan analog. Gutnick *et al.* do not anticipate Applicants' claimed invention.

Rejection of Claims 1 and 12-13 under 35 U.S.C. §103(a)

Claims 1 and 12-13 are rejected under 35 U.S.C. §103(a) as being unpatentable over Gutnick *et al.* further in view of Fino. The Examiner states that Gutnick et al. does not teach a polypeptide antigen coupled to a keyhole limpet hemocyanin and that Fino (U.S. Patent 5,464,746) teach polypeptide antigens coupled to carriers such as keyhole limpet hemocyanin. The Examiner concludes that, given 1) Gutnick *et al.* has taught a composition comprising an antigen and an emulsan wherein the emulsan is secreted from Acinetobacter and 2) Fino teach a polypeptide antigen coupled to a keyhole limpet hemocyanin carrier, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make a composition comprising a polypeptide antigen coupled to keyhole limpet hemocyanin and that one would have been motivated to make such a composition because it is well known to those skilled in the art than an antigen coupled with a carrier such as KLH increases immunogenicity.

Applicants claim in Claim 13 an immunization formulation that includes an emulsan or emulsan analog combined with an antigen that is dinitrophenol coupled to keyhole limpet hemacyanin.

As described above, Gutnick *et al.* does not anticipate the subject matter of Claims 1-11 and 37-38. Gutnick *et al.* teach a composition that includes β-emulsan and Freund's adjuvant. Gutnick *et al.* do not teach or suggest an immunization formulation that includes an emulsan or emulsan analog and an antigen.

Fino teaches an immunogen that includes a carbazole/dibenzofuran compound conjugated to keyhole limpet hemocyanin.

The addition of Fino does not remedy the deficiencies of Gutnick *et al.* As with Gutnick *et al.*, Fino does not teach or suggest an immunization formulation comprising an emulsan or emulsan analog and an antigen. Specifically, KLH is not an emulsan. Therefore, the Examiner's suggested combination of a polypeptide antigen and KLH would not be an embodiment of Applicants' claimed invention. Therefore, neither Gutnick *et al.*, nor Fino, taken separately or in combination, teach or suggest an immunization formulation comprising an emulsan or emulsan analog and dinitrophenol coupled to keyhole limpet hemacyanin

The combination of Gutnick *et al.* in view of Fino does not render obvious Applicants' claimed invention.

SUMMARY AND CONCLUSIONS

Applicants' specification particularly points out and distinctly claims the subject matter which they regard as their invention. Gutnick *et al.* do not anticipate Applicants' claimed invention under 35 U.S.C. §102, and the combination of Gutnick *et al.* in view of Fino, taken separately or in combination, do not render obvious Applicants' invention under 35 U.S.C. §103.

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned at (978) 341-0036.

Respectfully submitted,

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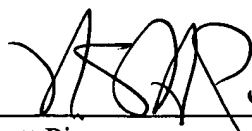
By 

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